Indiana Department of Education
Academic Standards Course Framework

AUTOMOTIVE SERVICES TECHNOLOGY I

Automotive Services Technology I is a one year course that encompasses the sub topics of the NATEF/ASE identified areas of Steering and Suspension and Braking Systems. This one year course offering may be structured in a series of two topics per year offered in any combination of instructional strategies of semester based or yearlong instruction. Additional areas of manual transmissions, differentials, automatic transmissions, air conditioning, and engine repair will be covered as time permits. This one year offering must meet the NATEF program certifications for the two primary areas offered in this course. Mathematical skills will be reinforced through precision measuring activities and cost estimation/calculation activities. Scientific principles taught and reinforced in this course include the study of viscosity, friction, thermal expansion, and compound solutions. Written and oral skills will also be emphasized to help students communicate with customers, colleagues, and supervisors.

- DOE Code: 5510
- Recommended Grade Level: Grade 11-12
- Recommended Prerequisites: Introduction to Transportation
- Credits: 2-3 credits per semester, maximum of 6 credits
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas
- This course is aligned with postsecondary courses for Dual Credit:
    - Ivy Tech
        - AUTC 101-Suspension and Steering
        - AUTC 121-Brakes
    - Vincennes University
        - AUTO 105-Transportation Fundamentals

Dual Credit

This course provides the opportunity for dual credit for students who meet postsecondary requirements for earning dual credit and successfully complete the dual credit requirements of this course.

Application of Content and Multiple Hour Offerings

Intensive laboratory applications are a component of this course and may be either school based or work based or a combination of the two. Work-based learning experiences should be in a closely related industry setting. Instructors shall have a standards-based training plan for students participating in work-based learning experiences. When a course is offered for multiple hours per semester, the amount of laboratory application or work-based learning needs to be increased proportionally.

Career and Technical Student Organizations (CTSOs)

Career and Technical Student Organizations are considered a powerful instructional tool when integrated into Career and Technical Education programs. They enhance the knowledge and skills students learn in a course by allowing a student to participate in a unique program of career and leadership development. Students should be encouraged to participate in SkillsUSA, the CTSO for this area.

Content Standards

Domain 1 – Employability

Core Standard 1 Students apply and adapt appropriate workplace behaviors and characteristics to prepare for automotive careers.

Standards

ASTI-1.1 Demonstrate effective interpersonal skills

ASTI-1.2 Develop leadership skills

ASTI-1.3 Research, analyze, and use data for work assignments

ASTI-1.4 Apply written communication skills

ASTI-1.5 Demonstrate effective listening and speaking skills

ASTI-1.6 Perform appropriate mathematical calculations correctly

ASTI-1.7 Exhibit a responsible work ethic

ASTI-1.8 Demonstrate accepted standards for ethical behavior

ASTI-1.9 Establish a personal career goal and develop objectives for achieving the goal

ASTI-1.10 Create a continuing education plan that identifies further education and training options

ASTI-1.11 Prepare for exams leading to certifications recognized by business and industry

ASTI-1.12 Develop skills needed to enter the workforce

ASTI-1.13 Evaluate resources that keep workers current in the career field

ASTI-1.14 Apply effective money management strategies

ASTI-1.15 Use and identify tolls and equipment used to repair brake systems

Domain 2 – Knowledge/Understanding

Core Standard 2 Students analyze vehicle components and system operations to establish accurate diagnosis and repair procedures.

Standards

ASTI-2.1 Allocate the appropriate resources for task completion

ASTI-2.2 Read and interpret written materials

ASTI-2.3 Demonstrate knowledge of vehicle system

ASTI-2.4 Explain safety procedures

ASTI-2.5 Disable supplemental restraint systems in accordance with manufactures' procedures

ASTI-2.6 Describe steering and alignment geometry

ASTI-2.7 Score satisfactory grade on tests, quizzes, and lab assignments

ASTI-2.8 Demonstrate proper shop safety practices while using brake tools and equipment

ASTI-2.9 Use and identify tolls and equipment used to repair brake systems

ASTI-2.10 Identify and explore operation, construction, and nomenclature of braking system components including hydraulic control devices

ASTI-2.11 Identify and explore operation and repair on and ABS and traction control systems

Domain – Diagnosis

Core Standard 3 Students analyze vehicle system defects to determine necessary service.

Standards

ASTI-3.1 Apply effective critical thinking, decision making, and problem-solving techniques

ASTI-3.2 Evaluate resources that keep workers current in the career field

ASTI-3.3 Conduct other related engine service activities

ASTI-3.4 Examine brake systems

ASTI-3.5 Analyze suspension and steering systems performance and determine repairs

ASTI-3.6 Diagnose power steering systems and determine need for replacement

ASTI-3.7 Diagnose steering and suspension components to determine need for replacement

ASTI-3.8 Analyze suspension and steering systems performance and determine repair

ASTI-3.9 Remove and replace steering and suspension components

ASTI-3.10 Diagnose McPherson strut assembly according to industry standards

ASTI-3.11 Diagnose rear suspension system and determine needed service or repair

ASTI-3.12 Remove, inspect and service or replace front or rear wheel bearings

ASTI-3.13 Check and adjust all 4-wheel alignment angles and measurements

ASTI-3.14 Inspect, rotate, mount, and balance tires

ASTI-3.15 Perform pre-alignment checks according to industry standards

ASTI-3.16 Use and identify tolls and equipment used to repair brake systems

ASTI-3.17 Diagnose and repair ABS and traction control systems

ASTI-3.18 Troubleshoot, clean, and replace components of transmission system.

Domain – Repair

Core Standard 4 Students select appropriate industry tools and procedures to perform service and repairs on various vehicle components and systems.

Standards

ASTI-4.1 Select and use appropriate tools and technology

ASTI-4.2 Implement quality assurance measures and safeguards

ASTI-4.3 Develop skills needed to enter the workforce

ASTI-4.4 Evaluate resources that keep workers current in the career field

ASTI-4.5 Conduct other related engine service activities

ASTI-4.6 Service brake systems

ASTI-4.7 Disable supplemental restraint systems in accordance with manufactures' procedures

ASTI-4.8 Diagnose steering and suspension components to determine need for replacement

ASTI-4.9 Remove and replace steering and suspension components

ASTI-4.10 Remove and replace McPherson struts according to industry standards

ASTI-4.11 Remove, inspect and service or replace front or rear wheel bearings

ASTI-4.12 Demonstrate proper shop safety practices while using brake tools and equipment

ASTI-4.13 Use and identify tolls and equipment used to repair brake systems

ASTI-4.14 Identify and explore operation and repair on and ABS and traction control systems

Process Standards

Common Core Literacy Standards for Technical Subjects

Reading Standards for Literacy in Technical Subjects 11-12

The standards below begin at grade 11 and define what students should understand and be able to do by the end of grade 12. The CCR anchor standards and high school standards in literacy work in

tandem to define college and career readiness expectations – the former providing broad standards, the latter providing additional specificity.

Key Ideas and Details

11-12.RT.1 Cite specific textual evidence to support analysis of technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.

11-12.RT.2 Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.

11-12.RT.3 Follow precisely a complex multistep procedure when performing technical tasks; analyze the specific results based on explanations in the text.

Craft and Structure

11-12.RT.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific context relevant to *grades 11-12 texts and topics*.

11-12.RT.5 Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.

11-12.RT.6 Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying important issues that remain unresolved.

Integration of Knowledge and Idea

11-12.RT.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

11-12.RT.8 Evaluate the hypotheses, data, analysis, and conclusions in a technical subject, verifying the data when possible and corroborating or challenging conclusions with other sources of information.

11-12.RT.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.

Range of Reading and Level of Text Complexity

11-12.RT.10 By the end of grade 12, read and comprehend technical texts in the grades 11-CCR text complexity band independently and proficiently.

Writing Standards for Literacy in Technical Subjects 11-12

The standards below begin at grade 11 and define what students should understand and be able to do by the end of grade 12. The CCR anchor standards and high school standards in literacy work in tandem to define college and career readiness expectations – the former providing broad standards, the latter providing additional specificity.

Text Types and Purposes

11-12.WT.1 Write arguments focused on *discipline-specific content*.

11-12.WT.2 Write informative/explanatory texts, including technical processes.

11-12.WT.3 Students will not write narratives in technical subjects. *Note: Students' narrative skills continue to grow in these grades. The Standards require that students be able to incorporate narrative elements effectively into arguments and*

informative/explanatory texts. In technical, students must be able to write precise enough descriptions of the step-by-step procedures they use in their technical work that others can replicate them and (possibly) reach the same results.

Production and Distribution of Writing

11-12.WT.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

11-12.WT.5 Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.

11-12.WT.6 Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.

Research to Build and Present Knowledge

11-12.WT.7 Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.

11-12.WT.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectivity to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation

11-12.WT.9 Draw evidence from informational texts to support analysis, reflection, and research.

Range of Writing

11-12.WT.10 Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.